Review Comments
2015 Groundwater Monitoring Work Plan
Former Rhône-Poulenc – Portland Site
Portland, Oregon
October 5, 2015

Submitted November 5, 2015

Following are the United States Environmental Protection Agency's (EPA) comments on the 2015 Groundwater Monitoring Work Plan, Former Rhône Poulenc-Portland Site (work plan), dated October 5, 2015, for the former Rhône Poulenc (RP) facility (ECSI #155), located at 7700 NW Front Ave., Portland, Oregon. EPA understands that collection of groundwater data at the RP facility is necessary to address data gaps in the conceptual site model and to support the feasibility study (FS). The purpose of EPA's review was to:

1. Evaluate if the scope of the work plan is adequate to address data gaps related to the groundwater pathway from RP sources to the Willamette River.
2. Determine whether sampling methods proposed in the work plan will provide data suitable for evaluating the groundwater pathway to the Willamette River in support of the feasibility study.

EPA's comments are as follows:

General Comments:

1. The objectives of the groundwater monitoring stated in Section 1.0 are too vague to determine if the proposed wells, laboratory analyses, frequency of sampling, and duration of sampling are sufficient to meet the data collection needs. Data quality objectives (DQOs) should be included in the work plan and used to support selection of the wells and analyses. For example, one of the stated objectives is to support the FS; accordingly, the preliminary remedial action objectives of the FS should be described in the work plan to inform the DQOs.

2. Current horizontal and vertical hydraulic gradients are needed to evaluate contaminant transport in the FS. The wells included in the work plan for groundwater level monitoring are located along a fairly narrow alignment that is not suitable for evaluation of hydraulic gradients across the locality of facility that is defined in the RI/SCE addendum report (DEQ 2015). EPA recommends that the same well network that was used during the May 7-8, 2007 DEQ-coordinated cooperative water level event be used for groundwater level monitoring and development of potentiometric surface maps. In addition to the groundwater level monitoring proposed in this work plan, surface water elevation data should be collected and used to evaluate tidal influences on groundwater elevations. Tidal influences on groundwater elevations should be taken into account when determining current groundwater flow directions and calculating horizontal and vertical gradients.

3. EPA understands that StarLink is conducting groundwater level monitoring using pressure transducers with data loggers at selected wells. The work plan should describe any pressure transducer monitoring that will be conducted as part of groundwater monitoring and the objectives for the continuous monitoring (see related Comment 1).

4. Preliminary modeling of Rhone Poulenc chlorobenzene and DDx groundwater pathways following Portland Harbor FS methodology raises concerns about possible exceedances in the Willamette River and supports a compelling need for additional data collection to address data gaps. Characterization should be completed as part of FS data collection activities. Based on a review of the list of monitoring wells in Tables 1 and 2 and shown on Figure 1, EPA believes there is a deficiency in the spatial distribution of wells and frequency of monitoring to complete characterization of the groundwater pathway to the river (see Comment 2). To address data gaps in characterization of the groundwater pathway to the river, the following additional wells and analyses or changes in frequency of monitoring should be added to the work plan:

Well ID	Frequency	Analyses	Rationale
Wells to Add to the Groundwater Monitoring Work Plan			
AL6-96	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate contaminant transport along the deeper groundwater flow path in the alluvial-colluvial gravel, downgradient of RP sources.
ASW-05	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.
MW-03-137	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate lateral contaminant transport and plume stability along deep groundwater flow path in the alluvial-colluvial gravel unit
MW-05-70	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate vertical contaminant transport from RP sources in the basalt unit at a location where LNAPL and DNAPL have historically been detected.
MW-05-175 (Gasco Prop.)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate contaminant transport along the deep groundwater flow path in the alluvial-colluvial gravel at the riverbank.
MW-15	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.

Well ID	Frequency	Analyses	Rationale
MW-14-110 (Gasco Prop.)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Define the northwestern extent of the deep groundwater plume.
MW-21-165 (Gasco Prop.)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Define the northwestern extent of the deep groundwater plume.
MW-19-180 (Gasco Prop.)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Define the northwestern extent of the deep groundwater plume.
RP-02-49	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the alluvium near the riverbank.
RP-02-66	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the basalt near the riverbank.
RP-03-30R	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium at a location where NAPL has historically been detected.
RP-03-52R	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium at a location where NAPL has historically been detected.
RP-04-48	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate vertical contaminant transport from RP sources to the alluvial-colluvial gravel at a location where DNAPL has historically been detected.
RP-06-95	Quarterly	VOCs, Herbicides, OCS, Dioxins/Furans, general water quality parameters	Evaluate lateral contaminant transport and plume stability along deep groundwater flow path in the alluvial-colluvial gravel unit

Well ID	Frequency	Analyses	Rationale
RP-06-105	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the basalt.
RP-14-11	Single	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in shallow alluvium near the riverbank.
RP-14-26	Single	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in deeper alluvium near the riverbank.
RP-14-49	Single	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in basalt near the riverbank.
RP-19-25	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.
RP-19-90	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium downgradient of RP source areas.
RP-19-129	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the basalt downgradient of RP source areas.
RP-21-125	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium downgradient of RP source areas.
RP-21-150	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the basalt downgradient of RP source areas.

Well ID	Frequency	Analyses	Rationale
RP-22-151	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the basalt downgradient of RP source areas. Well has not been sampled since 2007.
RP-23-85	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium downgradient of RP source areas.
RP-23-100	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium downgradient of RP source areas.
RP-23-125	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the gravel - basalt downgradient of RP source areas.
RP-25-86	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the alluvium downgradient of RP source areas.
RP-25-113	Single event	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Determine current contaminant concentrations in the basalt downgradient of RP source areas.
W-03-S(17)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.
W-04-S(16)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.
W-11-21	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.

Well ID	Frequency	Analyses	Rationale
W-15-S(14)	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.
W-16-31	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate the effectiveness of the OF-22B IRAM to limit preferential groundwater contaminant transport along the OF-22B stormwater system.
Wells in the Monitoring Plan to Increase the Frequency of Monitoring			
RP-07-84	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the alluvial-colluvial gravel near the riverbank.
RP-07-119	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the basalt near the riverbank.
RP-11-160	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate lateral contaminant transport and plume stability along deep groundwater flow path in the deeper alluvium near the riverbank.
RP-11-216	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate lateral contaminant transport and plume stability along deep groundwater flow path in the alluvial-colluvial gravel unit near the riverbank.
RP-13-33	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the alluvial-colluvial gravel near the riverbank.
RP-13-43	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the basalt near the riverbank.
RP-24-73	Quarterly	VOCs, Herbicides, OCIs, Dioxins/Furans, general water quality parameters	Evaluate plume stability in the alluvial-colluvial gravel near the riverbank.

Specific Comments:

1. Tables 1 and 2: Laboratory reporting limits should be provided for each of the constituents included under the analytical methods listed. The appropriate comparison criteria that should be used to evaluate groundwater results are the Preliminary Remediation Goals (PRGs) that EPA established for the Portland Harbor site. Laboratory reporting limits should be checked to verify that requested target detection levels are sufficient to meet the PRGs.

2. SOP-2, Section 2.0, #9: The SOP should specify what type of submersible pump (e.g., bladder pump, Grundfos submersible, etc.) would be used for groundwater sampling.

3. SOP-2, Section 2.0, #11: Teflon or Teflon-lined tubing should be used for sampling of organic compounds per EPA low-flow groundwater sampling protocols (EPA 1996 - Low-Flow [Minimal Drawdown)] Groundwater Sampling Procedures).

4. SOP-2, Section 3.0, first paragraph: A description of the "standard" purging and sampling methods should be included in SOP-2. It is unclear if the Low-Flow Purging and Sampling steps #8 or #9 are describing the standard purging and sampling method.

5. SOP-2, Section 3.0 Procedure, page 2 of 4, first paragraph: Criteria for what well is not amendable to low-flow purging should be defined in this SOP.

6. SOP-2, Section 3.0 Procedure - Low-Flow Purging and Sampling: The statement, "Although a drawdown of less than 0.3 foot is desirable, it is not necessary for successful low flow sampling," is not consistent with EPA low-flow groundwater sampling procedures. Sampling a low-yield well that exhibits increasing drawdown during low-flow purging may result in sampling stagnant water in the well casing that is not representative of groundwater from the formation, even if water quality parameters are stable. Samples collected by this method have a potential to underestimate actual volatile organic compound concentrations and potential for false positives for metals. EPA recommends following EPA 1996 low-flow groundwater sampling procedures to sample wells, including passive sample collection for low-yield wells not amendable to low-flow sampling procedures.

7. SOP-2, Section 3.0, Procedure – Low-Flow Purging and Sampling, Step #5: The statement, "to the midpoint of the zone to be sampled" needs clarification. If the zone to be sampled is based on the well screen interval, then that should be specified. If the zone to be sampled is some interval within the well screen, then the procedure for determining what portion of the screen interval to be sampled should be described. EPA recommends that wells should be sampled with pump intakes positioned at the same depths as the 2010 and previous monitoring events so that comparable data is obtained.

8. SOP-2, Section 3.0, Procedure – Low-Flow Purging and Sampling, Step #7: A water level drawdown criteria of +/- 0.1 feet for determining stabilization of water quality parameters is excessive. As stated in Specific Comment #6, EPA 1996 low-flow groundwater sampling procedures should be followed. If the water level is decreasing at a rate of 0.1 feet between 3

to 5 minute readings, then the well should not be sampled due to the risk of entraining stagnant casing water into the sample.

9. SOP-2, Section 3.0, Procedure – Low-Flow Purging and Sampling, Step #7: Turbidity should be included in the water quality stabilization criteria. Per EPA 1996 low-flow groundwater sampling procedures, a turbidity stabilization criteria of +/-10 percent between 3 to 5 minute readings is recommended.

10. SOP-2, Section 3.0, Procedure – Low-Flow Purging and Sampling, Steps #8 and 9: The proposed method may result in non-representative stagnant water from the well casing or aerated water from recharge to the dewatered screen zone being entrained in the sample. EPA recommends following EPA 1996 low-flow groundwater sampling procedures to sample wells, including passive sample collection.